

WHAT IS CLAIMED:

1. A vertical form-fill seal machine for the in-line manufacturing of food packages having mated fastener tracks with slider closures, comprising:

5 a supply of web material extending in a machine direction package portions extending in the machine direction and having;

a supply of mated fastener tracks;

a collar member receiving said web material;

10 a web drive transporting said web material over said collar in the machine direction, folding said web into overlying side-by-side portions, one against the other to form a continuous succession of package portions extending in the machine direction and having pairs of
15 overlying package walls which include overlying free edges;

a pair of fastener seal bars extending in the machine direction sealing a portion of said fastener tracks to the package walls extending in the machine
20 direction;

a pair of peel seal bars extending in the machine direction forming a peel seal between said package walls;

a supply of slider members mateable with said
25 mated fastener tracks for movement along said mated fastener track in opposite directions to open and close said mated fastener tracks;

a slider installation member inserting said slider members onto said mated fastener tracks; and

30 a pair of spaced-apart side seal bars extending at an angle to said machine direction, sealing portions of said package walls together to form respective side seals of the food package.

2. The machine of claim 1 wherein one of said side seal bars includes a tapered portion extending in the machine direction and located adjacent said fastener tracks.

5 3. The machine of claim 2 wherein the heat sink plate is supported from said collar.

4. The machine of claim 3 wherein said heat sink plate has the form of a metal finger and is metallurgically joined to said collar.

10 5. The machine of claim 1 further comprising a fastener track activation member forming an initial opening in said mated fastener tracks to receive a portion of said slider member.

15 6. The machine of claim 5 wherein said slider installation member pushes said slider members onto said mated fastener tracks adjacent the opening formed by said activation member.

20 7. The machine of claim 6 wherein said mated fastener tracks have a free edge and said the fastener track activation member comprises a funnel which is passed over the free edge of said mated fastener tracks to apply a compressive force at a point on said mated fastener tracks spaced from said mated fastener tracks free edge.

25 8. The machine of claim 8 wherein said movement of said funnel pivots said mated fastener tracks one against the other to form an opening at the free edge of said mated fastener tracks.

9. The machine of claim 1 wherein the mated
er tracks include respective mounting flanges overlying
one another and extending along the mated fastener
tracks.

5 10. The machine of claim 9 wherein the
mounting flanges extend from the fastener tracks
different amounts, with one mounting flange having a
greater height than the other, with the food package
viewed in an upright position.

10 11. The machine of claim 10 wherein the
fastener track seal bars seal free edge portions of said
package walls to said respective mounting flanges.

 12. The machine of claim 11 wherein said peel
seal bars join one face of said mounting flange of
15 greater height to a face of one of said package walls.

 13. The machine of claim 1 wherein said web
drive transports said web in a series of predetermined
stepped amounts.

 14. The machine of claim 13 further comprising
20 a position sensor sensing the web position, located
immediately adjacent said collar, the position sensor in
communication with said web drive to control transport of
said web material.

 15. The machine of claim 1 wherein said collar
25 forms a dead fold in said web extending in the machine
direction with an opening between said package walls
opposite said dead fold formed by said free edges.

16. The machine of claim 1 further comprising a curved accumulation track for receiving a plurality of said sliders arranged side-by-side in a serial succession.

5 17. The machine of claim 1 further comprising a registration device selectively applying tension to said mated fastener tracks to alter registration of said mated fastener tracks with respect to said web material.

10 18. The machine of claim 17 wherein said registration device comprises an idler roller engaging said mated fastener tracks and mounted for movement toward and away from a neutral position so as to alter tension applied to said mated fastener tracks.

15 19. The machine of claim 1 further comprising a stop forming station through which said mated fastener tracks pass, said stop forming station including cooperating horn and anvil members opposing the other on opposite sides of said mated fastener tracks, at least one of said horn and anvil members movable toward the
20 other to crush a portion of said mated fastener tracks to form back-to-back slider stop members, and at least one of said horn and said anvil movable away from one another to release said mated fastener tracks at the conclusion of a crushing operation.

25 20. The machine of claim 19 wherein said web drive moves said mated fastener tracks in a series of discontinuous steps, so as to cooperate with said stop forming station to form a series of spaced-apart back-to-back slider stop members along said mated fastener
30 tracks.

21. The machine of claim 1 further comprising a web position sensor mounted on said collar and connected to said web drive means to control operation of said web drive means.

5 22. The machine of claim 1 wherein said the fastener track seal bars and said peel seal bars are located beside one another.

23. The machine of claim 22 wherein said fastener track seal bars and said peel seal bars are
10 generally coextensive with one another.

24. The machine of claim 1 further comprising a second pair of spaced-apart side seal bars located beside said one pair of spaced-apart side seal bars and cooperating therewith to form two adjacent, consecutive
15 side seal's in said web material, associated with adjacent consecutive food package portions.

25. The machine of claim 1 wherein said mated fastener tracks have an A-shaped cross-section.

26. The machine of claim 1 further comprising
20 a heat sink plate disposed between said package walls, and between said pair of seal bars.

27. The combination of a shredded cheese product and a vertical form-fill seal machine for the in-line manufacturing of food packages having mated fastener
25 tracks with slider closures, comprising:

 a supply of web material extending in a machine direction package portions extending in the machine direction and having;

 a supply of mated fastener tracks;

30 a collar member receiving said web material;

a web drive transporting said web material over said collar in the machine direction, folding said web into overlying side-by-side portions, one against the other to form a continuous succession of package portions
5 extending in the machine direction and having pairs of overlying package walls which include overlying free edges;

a pair of fastener seal bars extending in the machine direction sealing a portion of said fastener
10 tracks to the package walls extending in the machine direction;

a pair of peel seal bars extending in the machine direction forming a peel seal between said package walls;

15 a supply of slider members mateable with said mated fastener tracks for movement along said mated fastener track in opposite directions to open and close said mated fastener tracks;

a slider installation member inserting said
20 slider members onto said mated fastener tracks; and

a pair of spaced-apart side seal bars extending at an angle to said machine direction, sealing portions of said package walls together to form respective side seals of the food package.

25 28. The machine of claim 27 wherein said web drive transports said web in a series of predetermined stepped amounts.

29. The machine of claim 27 further comprising a position sensor sensing the web position, located
30 immediately adjacent said collar, the position sensor in communication with said web drive to control transport of said web material.

30. A method of making a flexible package for food products, comprising the steps of:

- providing a supply of web material;
- paying out a first portion of the web material
- 5 defining a serial succession of package portions;
- providing a supply of mated fastener tracks;
- paying out of first portion of the mated fastener tracks;
- crushing a serial succession of spaced-apart
- 10 portions of said mated fastener tracks to form a serial succession of spaced apart back-to-back slider stop portions;
- providing a collar;
- drawing the web material over the collar in a
- 15 machine direction to fold the web material to form adjacent overlapping portions with overlying free ends defining a serial succession of package portions;
- aligning the mated fastener tracks in-line with the free ends of the overlapping portions;
- 20 joining a least a part of the mated fastener tracks to the free ends of the overlapping portions;
- forming a peel seal adjacent the free ends of the overlapping portion;
- forming a transverse, leading, side seal in
- 25 said overlapping portions to cooperate with said peel seal and said overlapping portions to form a pouch;
- advancing the web material and mated fastener tracks in the machine direction;
- providing a supply of sliders;
- 30 dispensing the sliders one at a time;
- inserting a slider on the mated fastener tracks of the pouch;
- filling the pouch with product;
- forming a transverse trailing side seal between
- 35 said overlapping portions to seal the contents of the pouch; and

severing the pouch from the web material and mated fastener tracks to form a separate flexible package.

31. The method of claim 30 further comprising
5 the step of lengthwise shifting of said first portion of the mated fastener tracks to register said first portion of the mated fastener tracks with said first portion of web material.

32. The method of claim 30 wherein the web
10 material and the mated fastener tracks are made of plastic and the joining step comprises plastic welding.

33. The method of claim 30 further comprising
the step of providing the mated fastener tracks with
15 depending flanges for joining to said overlapping portions.

34. The method of claim 33 wherein the step of forming a peel seal comprises joining one of the flanges to one of the overlying portions.

35. The method of claim 30 wherein the step of
20 forming a leading side seal comprises the step of tapering a portion of the leading side seal adjacent the fastener tracks so as to extend in the machine direction.

36. The method of claim 35 wherein the
25 tapering step includes spacing the leading side seal from the fastener tracks.

37. The method of claim 31 further comprising
the step of monitoring the position of web material at
30 the collar.

38. The method of claim 30 wherein the step of inserting the slider is performed before the step of filling the pouch.

39. The method of claim 30 wherein the step of
5 inserting the slider is performed after the step of filling the pouch.

40. The method of claim 30 wherein the step of joining at least apart of the mated fastener tracks to the free ends of overlapping portions is carried out with
10 sealing bars which span a plurality of consecutive bag portions.

41. The method of claim 40 wherein each bag portion receives multiple sealing operations of the sealing bars.

15 42. The method of claim 40 wherein the step of drawing of the web material over the collar to fold the web material forms a dead fold comprising a bottom end of the flexible package.

20 43. The method of claim 40 wherein the mated fastener tracks include downwardly depending flanges and the step of the joining at least apart of the mated fastener tracks to the free ends of the overlapping portions comprises the step of providing a heat shield and inserting the heat shield between the flanges while
25 applying the seal bars to the overlying free ends to joining the overlying free ends to respective flanges.

44. The method of claim 43 wherein the step of providing a heat shield includes suspending the heat shield from the collar.

45. The method of claim 30 further comprising the steps of:

providing a knife blade;
providing a side seal bar for forming the
5 transverse, leading side seal;
mounting the knife blade to side seal bar; and
applying the side seal bar and knife blade to
the first pouch to simultaneously carry out the steps of
severing the pouch while forming a transverse trailing
10 side seal.

46. The method of claim 30 further comprising the step of opening at least a portion of said mated fastener tracks in preparation for receiving the slider.

47. The method of claim 46 wherein said mated
15 fastener tracks have a free edge and wherein the step of opening at least a portion of said mated fastener tracks comprises compressing said mated fastener tracks at a point spaced from said mated fastener tracks free edge to rock said mated fastener tracks against one another to
20 form an opening at the free edge of said mated fastener tracks.

48. The method of claim 47 wherein said step of compressing said mated fastener tracks comprises providing a funnel and passing said funnel over the free
25 edge of said mated fastener tracks to apply a compressive force to said mated fastener tracks.

49. The method of claim 30 further comprising the steps of:

providing an idler roller;
30 mounting the idler roller for movement toward and away from a neutral position;

passing the mated fastener tracks over the idler roller; and

moving to the idler roller so as to alter tension on the mated fastener tracks to thereby register
5 said first portion of the mated fastener tracks with the first portion of said web material.

50. The method of claim to 30 further comprising the steps of:

providing a trailing side seal bar for forming
10 the transverse, trailing side seal of a leading pouch;

providing a leading seal bar for forming a transverse, leading side seal of a following pouch;

providing a knife blade;

mounting the knife blade between the trailing
15 side seal bar and the leading side seal bar;

associating with a leading side seal bar, trailing side seal bar, and knife blade for common movement; and

simultaneously contacting the pouch with the
20 following side seal bar and the knife blade to form a working end of the Web material and mated fastener tracks while contacting the working end with the leading side seal bar to form the transverse, leading, side seal.